DOCUMENT RESUME

ED 340 415 JC 920 018

AUTHOR Pearson, Charlene V.
TITLE Barrier to Success: Community College Students Critical Thinking Skills.
INSTITUTION Rancho Santiago Community Coll., Santa Ana, Calif.
PUB DATE 19 Sep 91
NOTE 10p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Academic Achievement; *Cognitive Measurement; Community Colleges; Comparative Analysis; *Critical Thinking; Statistical Analysis; *Student Characteristics; Tables (Data); Test Norms; *Thinking Skills; Two Year Colleges

ABSTRACT

In 1991, a study was conducted using the Watson-Glaser Critical Thinking Appraisal (CTA) to determine how well students at Rancho Santiago College (RSC), a large, multicultural community institution in Santa Ana, California, demonstrated critical thinking abilities. Written at the ninth grade reading level, the CTA attempts to assess an individual's abilities in the areas of inference, recognition of assumptions, deduction, interpretation, and evaluation of arguments. A sample of 470 students took the CTA, and scores were analyzed in terms of sex, age, ethnicity, educational level, college units, educational goals, and courses and prerequisites taken. Study findings included the following: (1) 61% of the RSC students scored below the 50th percentile, including 79% of the ethnic minorities in the sample and 41% of the whites; (2) older students scored significantly higher than younger students; (3) 91% of the students with high school diplomas from foreign countries and 86% of the students without a high school diploma scored below the 50th percentile; and (6) course comparisons indicated that students who took honors speech and communications scored higher than did students in such courses as criminal justice, counseling, and political science. Overall, the RSC study group fell below the norms of other college students from similar institutions. (JMC)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED340415

Barrier to Success: Community College Students Critical Thinking Skills

19 September 1991

Charlene V. Pearson

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

C. Pearson

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)"

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☒ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

Rancho Santiago Community College
Santa Ana, California

JC 920018

BEST COPY AVAILABLE

Pearson, C.

BARRIER TO SUCCESS: COMMUNITY COLLEGE STUDENTS CRITICAL THINKING SKILLS

INTRODUCTION

For students to be successful in higher education, they must have the ability to think "critically" and to understand and apply concepts at the college level. They should be able to reason inductively and deductively such as when criticizing or constructing arguments. This critical thinking ability is generally recognized as an important and pervasive educational objective, and is considered a desirable outcome of courses.

For community colleges, this view was reinforced in 1988 when changes were made in the California Community College Title V Regulations requiring that all AA degree credit courses require critical thinking ability; that courses require students to apply college level concepts, vocabulary, and language skills (55002). Designed to strengthen the AA degree, these new standards of rigor caused colleges to go through substantial curriculum adjustments (i.e. course revisions or reclassification).

Since the passage of these new regulations, California community colleges have done little in the area of student critical thinking assessment. For the classroom, this assessment of students allows instructors to have a better understanding of individual student thinking abilities,needs and development. It also provides information on possible instructional techniques instructors may wish to use to enhance student learning. For student service personnel, e.g. the college counselor, it provides information as to possible barriers to student success (matriculation) and to development of student self-esteem. Further, through the use of various critical thinking assessment instruments, educators can attempt to look at the processes of student learning and thinking.

METHOD

The major emphasis of this study was to determine how well students at Rancho Santiago College, a large multi-cultural community college campus, already do critical thinking; how students think rather than the answers they produce. With the awareness that there are several ways persons can be judged to be more or less proficient in a given critical thinking skill or at the integrated use of related critical thinking skills, a number of assessment instruments were reviewed with the final decision to use the Watson-Glaser Critical Thinking Appraisal.

This instrument measures certain critical thinking skills and provides a partial estimate of the extent to which students have developed their critical thinking abilities. The Critical Thinking Appraisal has been shown to relate to various measures of academic achievement including the S.A.T.'s, overall grade point averages, and individual course grades - indicators measuring academic success.

Written at a ninth grade reading level, the Critical Thinking Appraisal seeks to provide an estimate of an individual's standing through the composite of abilities by means of 5 sub-tests: sixteen items in each sub-test equaling an 80 item test. Items in this new form have been modified in the interest of clarity, current usage, and elimination of racial or sexual stereotypes.

The 5 sub-tests include exercises covering problems, statements, arguments and interpretations of data similar to those that are encountered on a daily basis at work, in the classroom, and in newspaper and magazine articles. The appraisal calls for responses to two different kinds of item content. Items having "neutral " content deal with weather, scientific facts or experiments and other subject matter about which people generally do not have strong feeling or prejudices. Items having "controversial" content refer to political, economic, and social issues that frequently provoke very strong feelings. The actual breakdown is shown in Table 1.

Table 1

Sub-tests of the Watson-Glaser

Test 1.	Inference - Discriminating among degrees of truth or falsity of inferences drawn from given data.
Test 2.	Recognition of Assumptions - Recognizing unstated assumptions of presuppositions in given statements o assertions.
Test 3.	Deduction - Determining whether certain conclusions necessarily follow from information in given statements or premises.
Test 4.	Interpretation - Weighing evidence and deciding if generalizations or conclusions based on given data are warranted.
Test 5.	Evaluation of Arguments - Distinguishing between arguments that are strong and relevant and those that are weak or irrelevant to a particular question at issue.

To make the test results more meaningful, it was necessary to relate the scores to specifically defined normative groups.

Although junior and community college norms were not of large populations, they do provide a reference for comparisons. Of the post-high school groups, norms for students in junior and community colleges reflected the poorest scores. Further, only 15-20% ethnic minorities are in the comparative norms while in the study group 60% were ethnic minorities.

The Watson-Glaser explains that the percentile value represents the midpoint of a percentile band that extends above and below the designated value (this helps compensate for the error component in scores, due to less than perfect reliability (Watson-Glaser). For reliability reasons the developers discourage the evaluation of individual sub-tests, but contend that critical thinking abilities for a class or group help in proving what critical thinking training is most needed by the group.

RESULTS

Using SPSS software, correlation coefficient studies were done (providing a measure of strength of association between 2 variables). Using chi-squares to determine differences among the groups, significance was set at $p<.05$ level. Analysis proceeded stepwise first comparing students in areas of sex, then age, ethnicity, educational level, college units, and educational goals. Further analysis was done comparing courses and pre-requisites.

Of the 470 students who took the Watson-Glaser Critical Thinking Appraisal, it was found that 39% (184) of the students scored at or above the 50th percentile while 61% (286) scored below the 50th percentile.

Gender

There was no significant difference found between the 236 men and 234 women in the study group. Sixty-three percent (149) of the males scored below the 50th percentile while 59% (137) of the females scored below the 50th percentile.

Age

There was a significant difference (.002) among ages and level of critical thinking skills: older students scored significantly higher than younger students. After age 22 there was a marked increase in the critical thinking scores with a significant increase at age 30 and older.

Ethnicity

Although the majority of students scored below the 50th percentile (Table 2), there was a significant relationship found between ethnicity and level of critical thinking skill. Of the students (61%) who scored below the 50th percentile, 79% were ethnic minorities while 41% were white.

Table 2

Ethnic Distribution

ETHNICITY	N=435	% ABOVE 50%ILE	% BELOW 50%ILE
American Indian	3	0.0	100.0
Black	16	19.0	81.0
Asian	63	24.0	76.0
Pacific Islander	4	0.0	100.0
Hispanic	135	22.0	78.0
Filipino	3	33.0	67.0
other non-white	1	0.0	100.0
White	207	59.0	41.0
Middle Eastern	3	33.0	67.0

Educational Level

There was a notable difference in educational level and scores on the Critical Thinking Appraisal. Of the students (39%) that scored above the 50th percentile, 5% (67% of them above the 50th percentile) had G.E.D.'s and all students with high school proficiencies (1%) scored above this level. Eighty-five percent of the sample had a high school diploma of which 61% scored below the 50th percentile. Ninety-one percent of the students with foreign diplomas scored below the 50th percentile while 86% of the students without a high school diploma scored below the 50th percentile.

College Units

There was a significant level of difference (.003) among students who had acquired more education and their critical thinking skill level and students with few or no completed college units. Eighty-eight percent of the students with less than 60 units scored below the 50 percentile.

Educational Goals

No significant difference was found.

Course Comparisons

Using rank order, course comparisons (Table 3) indicate that of the 12 courses in which students were sampled, Honor's Speech 101 and Communications 100 students scored higher (mean 53.4 and 52.5 respectively) than in courses such as Criminal Justice 101(47.1), Counseling 116#2 (45.1), and Political Science 101 (47.6).
The course population median was 50.5 with a range of class means from 45.1 to 53.4. When using the *t*-test to compare the highest (53.4) and the lowest (45.1) course mean scores, there was no significant difference found in students level of critical thinking $t(30)=.83$, $p<.05$.

Table 3

Course Comparisons

RANKING	MEAN	ADVISORY PREREQUISITE
Honors' Speech 101	53.4	4
Communication 100	52.5	3
Gen. Chemistry 219	51.7	4
R.N 151	51.5	4
Philosophy 106	51.4	4
110		4
English 102	50.5	Eng.101
Counseling 116 #1	49.8	3
English 101	49.8	10th gr.rdg.level
Political Science 101	47.6	3
Criminal Justice 101	47.1	3
Counseling 116 #2	45.1	3

When looking at individual scores in all courses, inference (sub-test 1) showed the poorest results in all courses with deduction (sub-test 3) the next lowest.

Pre-requisite Levels

Courses indicate advisory prerequisites which are considered desirable English and reading skills for success in a course. They are recommended, but not mandatory, prior to enrollment. Level 3 indicates an 8th grade reading level. This is the minimum reading proficiency level required for high school graduation in California. Level 4 indicates approximately a 10th grade reading level. This is the minimum level required for an AA/AS degree at Rancho Santiago College. The advisory pre-requisites appear to cluster some of the more capable students; yet even the higher ranked classes reflect a small deviation from the population means.

CONCLUSIONS

This assessment instrument measured the extent to which students had mastered certain critical thinking skills. The results indicate that this study group fell below the norms of other college students from similar educational institutions and need additional assistance in the development of their critical thinking skills.

When specific student variables were measured, there was a significant relationship between critical thinking skill level and student age, ethnicity, and completion of college units. Students with a limited number of college units or who were young or who were an ethnic minority had significantly lower critical thinking skills than students who were older or who had completed a substantial number of units or who were white. Therefore, these variables could be used to help identify students who may need further assistance in their development of critical thinking - to remove potential barriers to their college success.

All courses from which the study groups were sampled met higher education transfer level criteria for the California State University system; some of these courses also met criteria for transfer to the University of California system. Academic or vocational, students in these courses fell below what would be expected of this group. For the two-year transfer or vocationally oriented student, their career success may be hindered by the lack of these developed critical thinking skills.

It was not the intent of this study to find fault but rather to explore possible reasons and work towards removing barriers to students growth and success in community college. Based on findings, most students in the study group had not developed their critical thinking skills at a level that would enhance their student learning and success in a higher education institution.

RECOMMENDATIONS

Being an important factor in educational success and a major goal of community college instruction, the ability to think critically is also known to play an important role in various kinds of occupations, particularly those in which careful analytical thinking is an essential part of the job. Therefore, community colleges need to continue to develop and provide a vehicle for student critical thinking skill development.

There is evidence from experimental studies in the classroom that critical thinking can be substantially improved by certain kinds of instruction and guidance woven into the regular school curriculum (Glaser, 1985). Student service personnel need to work closely with instructional faculty both in and outside the classroom to support and assist in the development of student critical thinking abilities. This may be in areas such as student assessment and/or helping students understand the affective domain and its relationship to critical thinking.

Students lacking experience in differentiating between merely learning what is in a text and thinking through the issues under discussion may be one of the contributors to poor skill development. Critical thinking skills could be enhanced by curriculum and instruction which re-enforces preparatory study of the reasoning operations characteristic of the various disciplines and which focuses explicitly on the techniques of critical and constructive thinking.

Further, recommendations are made to continue to investigate and provide classroom research in critical thinking assessment. It may improve student learning and instruction by: raising questions about the nature of instruction; providing feedback to instructors (i.e. different instructional strategies), and assisting instructors to refine goals and standards. Further, barriers to classroom learning may be removed if faculty are cognizant of student critical thinking skill levels upon entrance to classes. It may act as an indicator for "help" in order to have course success.

Wanting to improve the quality of learning in the classroom (i.e. getting students to think), faculty need to continue to transmit their skills, knowledge, and commitment to critical thinking. There needs to be continued work among the faculty in developing critical thinking skills across the curriculum and experimenting with various instructional methodologies.

In closing, the support through staff development funds, flex-time, classroom research, and the Rancho Santiago Foundation for this special project has provided me the opportunity to work with other

faculty and do research in critical thinking - which has been concerned not only with critical thinking testing, but also with conceptualizing critical thinking and with critical thinking instruction and curriculum development. The flex-time provided the necessary hours to meet, plan, and set up critical thinking assessment in classrooms and review outcomes. Discussion as to instructional methodologies, curriculum content, and student success is being evaluated. Staff development funds provided the necessary impetus to a very time consuming and rewarding project.

REFERENCES

Facione, P. A. (1990). Critical thinking: A statement of expert consensus for purposes of educational assessment and instruction. (ERIC Document Reproduction Service No. ED 315423).

Glaser, E. Educating for responsible citizenship in a democracy," National Forum, Winter, 1985.

Watson, G., & Glaser, E. (1980). Watson-Glaser critical thinking appraisal manual. New York: The Psychological Corporation.

Charlene Pearson, Ph.D.
Counseling
Rancho Santiago College

ERIC Clearinghouse for
Junior Colleges
FEB 07 1992